



United States  
Environmental  
Protection Agency

Office of Wetlands,  
Oceans, and Watersheds  
Washington, DC 20460

Office of Air Quality  
Planning and Standards  
Research Triangle Park, NC 27711

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# Frequently Asked Questions About Atmospheric Deposition

## A Handbook for Watershed Managers

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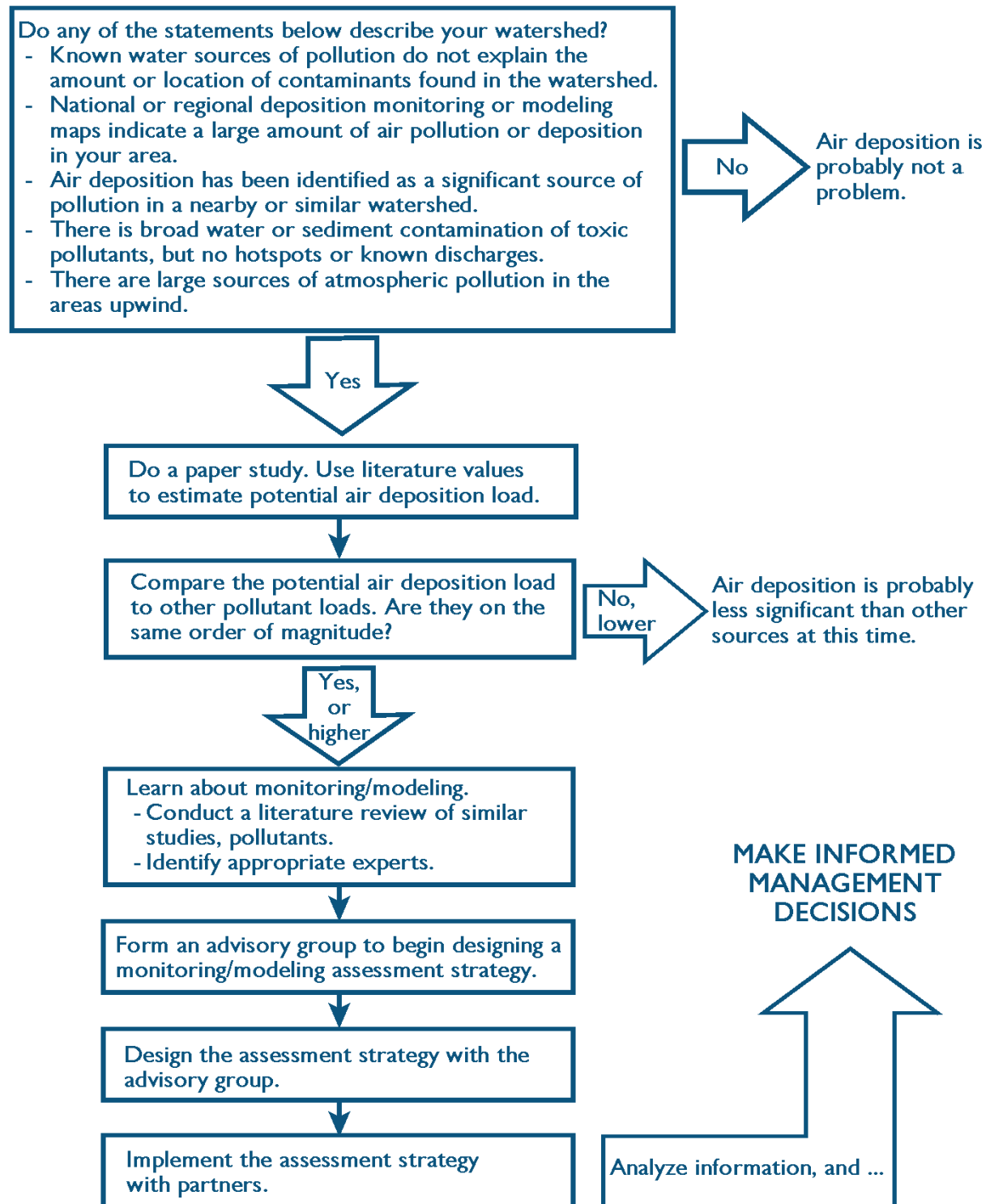
# Acronyms

APTI	Air Pollution Training Institute
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CALMET	California Meteorological Model
CALPUFF	California Puff Model
CASTNet	Clean Air Status and Trends Network
CBPO	Chesapeake Bay Program Office
CMAQ	Community Modeling for Air Quality
EPA	Environmental Protection Agency
GLNPO	Great Lakes National Program Office
HCB	hexachlorobenzene
HYSPLIT	Hybrid Single Particle LaGrangian Integrated Trajectory Model
IADN	Integrated Atmospheric Deposition Network
IMPROVE	Interagency Monitoring of Protected Visual Environments
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NADP-AIRMoN	National Atmospheric Deposition Program-Atmospheric Integrated Research Monitoring Network
NADP-MDN	National Atmospheric Deposition Program-Mercury Deposition Network
NADP-NTN	National Atmospheric Deposition Program-National Trends Network
NAICS	North American Industry Classification System
NAMS	National Air Monitoring Stations
NDAMN	National Dioxin Air Monitoring Network
NEI	National Emission Inventory
NEP	National Estuary Programs
NOAA	National Oceanic and Atmospheric Administration
NSPS	new source performance standard
NSR	new source review

PAHs	polycyclic aromatic hydrocarbons
POM	polycyclic organic matter
PCB	polychlorinated biphenyl
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RADM	Regional Acid Deposition Model
RELMAP	Regional LaGrangian Model of Air Pollution
REMSAD	Regulatory Modeling System for Aerosols and Deposition
SCC	Source Classification Codes
SIC	Standard Industrial Classification
SIP	state implementation plan
SLAMS	State and Local Air Monitoring Stations
SPMS	Special Purpose Monitoring Stations
TBEP	Tampa Bay Estuary Program
TMDL	total maximum daily loads
TRI	Toxic Release Inventory
USGS	United States Geological Survey
VOC	volatile organic compounds

# Decision Flow Diagram

The diagram has been placed in the front of this handbook for ready reference. It summarizes the decisionmaking process suggested in the handbook. The process presumes you have identified water quality or ecological problems in your waterbody that could be due to pollution.





# I. Purpose of Handbook



The purpose of this handbook is to provide information about what atmospheric deposition is, how it can be measured, and how the significance of the problem may be determined for a particular area. The handbook may not answer all your questions directly; rather, it is intended to lead you in the right direction and provide enough information to decide how to address the issue in your area.

Atmospheric deposition is now recognized in many areas as a significant cause of water quality problems, acidification of streams and lakes, and toxic contamination of fish and the birds and mammals that eat them. Several National Estuary Programs (NEPs) have calculated that atmospheric deposition of at least one pollutant is a significant portion of the total pollutant load to their estuaries. It is something water resource managers are finding they may need to take into account if they are to be effective stewards of their environmental resources.

There are challenges to managing the problem. For example, traditionally there has been a separation of air and water legislation and programs in all levels of government. Atmospheric deposition does not always fit neatly into most resource management agencies' media-specific programs and organizational structures. Also, unlike effluents discharged directly into a waterbody, the sources of air pollution may be near the waterbody or distant, such as in another state or perhaps even another country.

However, in the last decade, there has been legislation explicitly to address atmospheric deposition. For example, when the Clean Air Act (CAA) was amended in 1990, Congress included authorization to reduce emissions of sulfur dioxides and nitrogen oxides from utilities to address the problem of acid rain, which was having a detrimental effect in many areas, including the Adirondacks region of New York and northern New England. At the same time, Congress added requirements to the CAA that the

Environmental Protection Agency (EPA) assess the impact of atmospheric deposition of toxic air emissions (and other air pollutants of concern) on certain waterbodies collectively known as the Great Waters. EPA's current guidance also specifies that states should include waterbodies with atmospheric sources of pollution on their lists of impaired waters that require total maximum daily loads (TMDLs). A few states have already developed a TMDL with an allocation for atmospheric deposition as part of the total pollutant load. To address this kind of multimedia problem, air and water quality managers must work together closely.

If you believe water quality or ecological problems in your waterbody result from particular pollutants, you may need to consider air deposition as a possible contributor of those pollutants. Your first question is likely to be: How do I know if I need to worry about atmospheric deposition? This handbook helps you answer that question. If it turns out you do need to worry about atmospheric deposition, the questions then become: What kind of data do I need and how much? For which pollutants? How should I monitor? Where do the monitoring sites need to be located? When should I use models? Which ones? How do I identify which sources are responsible? How do I translate all this information into a coherent management strategy? These questions were collected from local watershed managers who are, or have been, in the position of needing to know how atmospheric deposition contributes to their water quality problems and what they can do about it.